

PCT

## INTERNATIONAL PRELIMINARY EXAMINATION

(PCT Article 36 and Rule 70)

REC'D 22 MAR 2005

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Applicant's or agent's file reference 2339-101	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/CA 03/01534	International filing date (day/month/year) 03.10.2003	Priority date (day/month/year) 04.10.2002
International Patent Classification (IPC) or both national classification and IPC G06F3/033		
Applicant HUMAN INTERFACE TECHNOLOGIES INC.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 8 sheets, including this cover sheet.  
  
☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 12 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  29.04.2004	Date of completion of this report  18.03.2005
Name and mailing address of the International preliminary examining authority:   European Patent Office - Gitschiner Str. 103 D-10958 Berlin T I. +49 30 25901 - 0 Fax: +49 30 25901 - 840	Authorized Officer  de la Torre, D  Telephon No. +49 30 25901-441  

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/CA 03/01534

## I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

### Description, Pages

9-12 as originally filed  
1-8 received on 31.01.2005 with letter of 27.01.2005

### Claims, Numbers

1-16 received on 31.01.2005 with letter of 27.01.2005

### Drawings, Sheets

1/9-9/9 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/CA 03/01534

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

**see separate sheet**

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1-16
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-16
Industrial applicability (IA)	Yes: Claims	1-16
	No: Claims	

2. Citations and explanations

**see separate sheet**

**R Item I**

**Basis of the opinion**

1. Amended claims 1, 9 and 10 filed with the letter dated 27 January 2005 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT.
- 1.1. Claim 1, lines 9 and 10, and claim 9, lines 7 and 8, state that the recognition software analyse the graphical input symbols one after another without interruption or delay. This feature is neither disclosed by, nor directly and unambiguously derivable from the application as originally filed. The applicant probably refers to the disclosure in the description on page 8, lines 13 to 20, where however it is merely disclosed that the characters are recognized and replaced by its corresponding character data from a computer font while the user proceeds with additional handwritten entries.
- 1.2. In claim 9, point (a), first line, means for recording handwritten symbols are described. However, this feature is neither disclosed by, nor directly and unambiguously derivable from the application as originally filed. The description only discloses means for recognition handwritten symbols (see e.g. the description, page 1, lines 6, and page 3, line 11: "handwritten recognition software").

The same objection applies to claim 10, line 1.

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

2. The following documents D1 to D5 are referred to in this communication; the numbering will be adhered to in the rest of the procedure:

D1: US 5528743 (TOU et al.) 18 June 1996

D2: EP 0689124 A (CANON) 27 December 1995

D3: US 5276794 (LAMB) 4 January 1994

D4: US 5220649 (FORCIER) 15 June 1993 \*

D5: "Free On-Line Dictionary Of Computing"; 3 December 2000 \*

\* refers to a document cited as evidence of the skilled person's general knowledge.

3. The application does not meet the requirements of Article 6 PCT, because claims 2 to 8 are not clear.

Dependent claims 2 to 8 are interface claims that depend on claim 1, which is a system claim. The category of these claims is therefore unclear, and should be drafted as system claims.

4. Independent claims 1 and 9, and dependent claims 2, 10 and 12 do not meet the requirements of Article 33(3) PCT because their subject-matter does not involve an inventive step with respect to each of documents D1 to D3.

- 4.1. Document D1 discloses a pen-based computer (10) as well as a method for inputting information to the computer (10) combining the following technical features of independent claims 1 and 9, and dependent claims 1, 10 and 12 (see in particular figures 1 to 4 and accompanying text).

The pen-based computer (10) of D1 includes a sensing surface (see column 4, lines 16 to 20: the sensitive membrane of display assembly 20) conditioned for hand entering and editing of graphical input symbols (see column 5, lines 14 to 23; see also figure 2 and column 5, lines 54 to 55: the graphic object G entered on the note area 54a).

The sensing surface (20) has an area (see figure 2: the note area 54b) corresponding to a data input field.

The pen-based computer (10) also includes recognition software which analyses the graphical input symbols (see column 5, lines 26 to 29: the operative system and application programs) and generates the data to a display (20) to automatically superimpose and replace said graphical input symbols with a display field of character data corresponding to the graphical input symbols on the data input field (see column 5, lines 29 to 32; see also figures 3a to 3b and column 7, lines 59 to 66: when writing words on the screen, the recognized words are displayed on the same area of the display where the words were written; see also figure 4 and column 8, line 22 to column

9, line 11: the computer carries out an automatic detection and superimposing of the character data).

- 4.2. Document D2 also discloses a pen-based computer (10) as well as a method for inputting information to the computer (10) combining the following technical features of independent claims 1 and 9, and dependent claims 1, 10 and 12 (see in particular figures 1, 8A to 9B and accompanying text)

Document D2 describes a handwritten information processing apparatus (see column 1, line 19) for inputting information having a sensing surface (4) for entering graphical symbols (see column 1, lines 21 to 23: handwritten characters must necessarily be input on a surface; see also column 3, lines 35 to 39: the transparent coordinate input board). This symbols may also be edited (see column 1, lines 28 to 39).

The handwritten information processing apparatus includes a display (6) for displaying stroke information (see column 3, lines 50 to 56) and software (see column 1, line 20: the word processor) that superimposes the recognized input characters at the same position on the display (6) where the input operation was performed (see column 1, lines 19 to 26).

- 4.3. Furthermore an identical disclosure is found in D3 (see in particular figures 1 to 2B; column 1, lines 5 to 63; and column 3, lines 12 to 31).
- 4.4. The subject-matter of independent claims 1 and 9, and dependent claims 1, 10 and 12 differs from the above teaching of each of D1, D2 and D3 only in that the different characters are recognized one after each other, without interruption or delay.

This feature solves the technical problem of generating a quicker display, through the conversion of the text on a character by character basis instead of through the conversion on a word by word basis.

Having a quicker display is a generic advantage which the skilled person and the user would always aim at, so that the recognition of the problem as such does not involve an inventive step. Therefore, the skilled person would provide the functionality of a character by character conversion whenever he or the user is prepared to forego the

advantages of a word by word or a line by line recognition (slower conversion requires less processing power and hence a cheaper device can be provided; moreover converting a whole word or sentence allows to take account of context, thereby reducing the number of conversion errors).

Hence selecting the above distinguishing feature amounts to a mere tradeoff between known advantages and disadvantages (speed versus cheap processor and reduced error rate), which in itself does not involve an inventive step (see the leading case relating to the optimisation of parameters: T36/82, OJ EPO 1983, 269; see more particularly T38/87 at point 4.1.7, stating that acceptance of certain known disadvantages in order to be able to make use of certain advantages as a compromise between conflicting parameters results in no surprising effect and is therefore to be regarded as obvious).

In addition it is noted that for the implementation of the claimed functionality, the present application does not disclose any specific means that would involve an inventive step (such as the use of a specific recognition algorithm for handwritten characters).

- 4.5. He would therefore, starting from either one of D1, D2 or D3 and using only his ordinary skills, arrive at the subject-matter of independent claims 1 and 9, and of dependent claims 1, 10 and 12, which is therefore obvious.
5. The remaining dependent claims 3 to 8, 11, and 13 to 16, do not contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect to or inventive step (Article 33(3) PCT).
  - 5.1. The features added by claims 3 and 11 are rendered obvious by D4 (see figure 1 and column 6, lines 45 to 52). Those added by claims 4 and 13 are known from D2 (see column 1, lines 28 to 34: the "X" symbol initiates the action of deleting a word).
  - 5.2. The additional features of claims 5, 6, 7, 14 and 15 (contacting the touch sensitive surface with the pen or stylus and holding it for a predetermined amount of time) relate to a standard way of starting an editing mode (see e.g. D4, column 13, lines 32 to 60 and in particular lines 41 to 44: the different ways of initiating a gesture, which represent editing operations; as a way of example see column 15, lines 20 to 45: the lifting of the

pen after a predetermined amount of time defines the "insert/collapse moving space gesture"). Variations among different editing functions would fall within the competence of the skilled person.

5.3. The additional features of claims 8 and 16 are known from D2 (see figures 9A and 9B and accompanying text: the words or character data are corrected without moving the pen or stylus outside the input field).

6. For the sake of completeness the following minor deficiencies are mentioned.

Contrary to the requirements of Rule 6.3(b) PCT, the independent claims are not properly drafted in the two-part form, with those features which in combination are part of the closest prior art (cf. document D1) being placed in the preamble.

7. Because of the reasons stated in sections 1 to 6 above, claims 1 to 16 are not allowable. In view of the available prior art, it does not appear that any part of the application could serve as a basis for a new allowable claim.



## METHOD OF COMBINING DATA ENTRY OF HANDWRITTEN SYMBOLS WITH DISPLAYED CHARACTER DATA

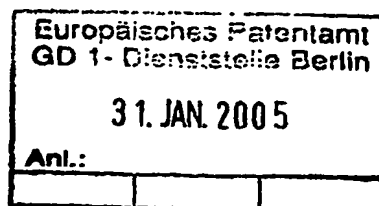
### FIELD

The present invention relates to a method for combining data entry produced with  
5 a stylus on a sensing surface such as a computer touch screen or digitising tablet, with display of  
the character data corresponding to each handwritten symbol. Handwriting recognition software  
is used to produce the character data corresponding to each symbol.

### BACKGROUND

10 Systems with handwriting recognition include electronic notebooks and personal  
digital assistants (PDAs), which are portable computers incorporating a touch screen graphics  
display; and also non-portable computer workstations equipped with a digitising tablet and  
graphics display. Both types of systems have a pen input function when the user draws or writes  
with a stylus on the surface of the touch screen or digitising tablet. For handwritten data entry,  
15 such systems utilize a graphical user interface (GUI) presenting two spatially separate visual  
fields on the graphics display: first, a field where text characters are to be inserted by a text  
editing software program into a document (display field), usually showing a cursor to indicate  
the point of insertion for character data; and second, one or more fields (entry fields), where the  
user draws with the stylus to enter handwritten data.

20 After recognition and conversion of the handwritten data, the resulting character  
data appear in the display field at the point of insertion indicated by the cursor. In a typical  
design, not only are the entry and display fields spatially separate, but also the position, size,



location, and other features of the character data bear little relation to the appearance of the original handwritten input.

When the stylus is moved outside of an entry field, it typically operates as a pointing device to invoke other functions of the computer, such as editing text contained in the display field, and changing the insertion point in the display field.

Typical prior methods of data entry with a stylus present the following difficulties to the user.

1) visual attention must constantly be shifted between the entry and display fields;

2) the stylus must be moved repeatedly between the display fields, to perform editing functions, and the entry fields, to continue entering handwritten data;

3) the separate entry fields may use as much as one half of the available graphics display area on a small hand-held device such as a PDA, reducing the amount of other information that can be displayed;

4) often, users must select the desired writing mode (characters, numbers, punctuation) and may forget which writing mode is currently active, or may enter the wrong type of handwritten symbol in an entry field; and

5) in many systems each entry field accepts a single character only, which must be recognized before the system will accept further handwritten data.

U.S. Patent No. 5,528,743 issued to Tou et al. describes a method of inputting information for the purpose of word processing. In word processing displayed text is formatted

into words, sentences and paragraphs. Tou et al. describes a number of calculations based on the spatial relationship of the position of newly entered graphical input symbols to the positions of paragraphs of formatted character data already existing on the display. Displayed character data are formatted into paragraphs, not necessarily superimposed on input symbols. For example, in Figure 3a of Tou et al. the handwritten symbol "three" entered near the right margin is displayed in Fig. 3b near the center of the line. The handwritten input below the existing character data in Fig. 3b is displayed as character data on the line above Fig. 3c, not in the position in which it was entered.

European Patent Publication No. EP 0689124 (Canon) is concerned with recognizing handwritten symbols which are gestures and distinguishing these from other handwritten input, and performing editing and other operations specified by the gestures. The interaction described in the body of the patent, and in their claims, requires several steps with menu prompts for the user to execute a gesture action. In the 'Description of Related Art' Canon states that when handwritten characters are input to arbitrary positions, recognition processing for the characters is performed and the recognition results are displayed at the positions where the handwriting input operation was performed. However, it is not disclosed whether a user must wait after writing each character until the system analyses and prints out that character or carries out the command operation represented by that character before writing the next character. It is also not disclosed whether or not the recognized input characters are superimposed on the handwritten input characters or are merely placed near them.

U.S. Patent No. 5276794 issued to Lamb describes the handwritten entry into a single-line field based on the position where the handwriting is initiated, or in the field that is

active, even if some or all of the handwriting falls outside the display field. Character data are displayed left-justified in the single-line field, regardless of location of the handwritten input. For example, in Fig. 2a the four symbols "FRED" are entered in the right half of the input field, but the recognition is displayed near the margin (see Fig. 2b). In addition, the recognition and display data are not immediate, but triggered by a time-out or other strategy to determine when the user has completed the input for a field.

U.S. Patent No. 5,220,649 issue to Forcier describes a system in which handwritten input is displayed as "digital ink" (i.e., not automatically recognized and converted to character data) and editing mode is initiated with a timeout.

Accordingly, it is an object of the present invention to provide an improved means of data entry and editing by superimposing the input field and the display field on a GUI. It is a

further object of the invention to provide an interface in which graphic symbols are entered by the user in an input field, and then are immediately replaced with the symbols' corresponding character data in approximately the same location. It is yet a further object of the invention to provide a means of correcting and editing character data without moving the stylus outside the input field.

## SUMMARY OF THE INVENTION

According to the invention there is provided a pen or stylus-operable system for a computer or computing device, which includes a graphical user interface coupled to said computer and having a sensing surface, the sensing surface controlled by the graphical user interface and having means for hand entering and editing of graphical input symbols. Handwriting recognition software on the computer is operative to analyze the graphical input symbols one after another without interruption or delay and to superimpose a display field of character data corresponding to the graphical input symbols on the data input field.

Advantageously, the sensing surface is a display surface. Alternatively, the sensing surface could be a tablet separate from the display surface.

The handwriting recognition software also initiates an action based upon the graphical input symbol. Preferably, the action is an editing mode wherein the pen or stylus contacts the sensing surface without moving for a predetermined minimum amount of time.

Symbol recognition of handwritten input is a default mode and editing mode is initiated with a timeout.

5

Preferably movement of the pen, in predefined ways, without being removed from data input field, causes corresponding editing functions to be effected.

The character data may be corrected and edited in the editing mode without moving a cursor for the pen or stylus outside the data input field of the sensing surface.

10

In another aspect of the invention there is provided a apparatus for combining data entry of handwritten symbols with displayed character data in a pen or stylus-operable graphical user interface for a computer or computing device, which includes means for recording and displaying handwritten graphical input symbols as they are entered on a data input field of a display surface; and handwriting recognition software for analysing continuously, without interruption or delay and automatically superimposing on the display field character data corresponding to the graphical input symbols.

15

Preferably, the means for recording is a sensing surface operative to receive and record the graphical input symbols. The means for displaying is the display surface or, alternatively may be a part of the display surface.

20

The handwriting recognition software may initiate an action based upon the graphical input symbol. The action may be an editing mode when the pen or stylus contacts the display surface for a predetermined minimum time without moving.

- 5                    Movement of the pen in predefined ways, without being removed from the data input field, may cause corresponding editing functions to be effected.

Character data may be corrected and edited in the editing mode without moving the pen or stylus outside the data input field.



**I CLAIM:**

(77)

1. A pen or stylus operable system for a computer, comprising:
  - (a) a graphical user interface coupled to said computer (110, 112, 114) and having a sensing surface (11) said sensing surface having an area corresponding to a data input field (13), said sensing surface controlled by said graphical user interface and having means for hand entering and editing of graphical input symbols (31, 32);
  - (c) handwriting recognition software on said computer operative to analyze said graphical input symbols (31, 32) one after another without interruption or delay and to automatically superimpose on and replace said graphical input symbols with a display field of character data (33) corresponding to said graphical input symbols (31, 32) on said data input field (13).
2. An interface according to claim 1, wherein said sensing surface (112) is a display surface.
3. An interface according to claim 1, wherein said sensing surface (112) is a tablet (11) separate from a display surface.
4. An interface according to claim 1, wherein said handwriting recognition software also initiates an action based upon said graphical input symbol.

5. An interface according to claim 1, wherein said handwriting recognition software initiates an editing mode when said pen or stylus (12) contacts said sensing surface (11) without moving for a predetermined minimum amount of time.
6. An interface according to claim 5, wherein symbol recognition of handwritten input is a default mode and editing mode is initiated with a timeout.
7. An interface according to claim 5, wherein movement of said pen (12), in predefined ways, while being held in continuous contact with the sensing surface, without being removed from said data input field, activates corresponding editing functions.
8. An interface according to claim 7, wherein said character data is corrected and edited in said editing mode without moving a cursor for said pen or stylus (12) outside said data input field of said sensing surface (11).
9. Apparatus for combining data entry of handwritten symbols with displayed character data in a pen or stylus-operable graphical user interface for a computer or computing device, comprising:
  - (a) means for recording and displaying handwritten graphical input symbols as they are entered on a data input field of a display surface; and
  - (b) user recognition software for analyzing said graphical input symbols one after another continuously without interruption or delay and automatically

superimposing on and replacing said graphical input symbols (31, 33) with a display field character data corresponding to said graphical input symbols.

10. Apparatus according to claim 9, wherein said means for recording is a sensing surface (11) operative to receive and record the graphical input symbols.

11. Apparatus according to claim 10, wherein said means for displaying is said display surface (112).

12. Apparatus according to claim 10, wherein said sensing surface (112) is at least part of said display surface (112).

13. Apparatus according to claim 9, wherein said handwriting recognition software also initiates an action based upon said graphical input symbol.

14. Apparatus according to claim 9, wherein said handwriting recognition software initiates an editing mode when said pen or stylus (12) contacts said display surface (112) for a predetermined minimum time without moving.

15. Apparatus according to claim 14, wherein movement of said pen, without being removed from said data input field, in predefined ways, while held in continuous contact with the sensing surface, activates corresponding editing functions to be effected.

16. Apparatus according to claim 15, wherein character data is corrected and edited in said editing mode without moving a cursor for said pen or stylus outside said data input field.